

## APPENDIX

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## APPENDIX A. METHODOLOGICAL SUPPLEMENT

### Data Description

Data were extracted for all non-elderly adults (18-64 years) surveyed in the 2011-2015 BRFSS. BRFSS is a national telephone survey conducted by the Centers for Disease Control and Prevention, collecting data from approximately 400,000 adults each year from all 50 states, the District of Columbia, and several territories regarding health-related risk behaviors, health status, and use of preventive services. The data are designed to be representative of the U.S. non-institutional population. The collection methodology, demographics, and limitations of this sample have been described elsewhere [1,2]. We used sequential, random hot deck imputation to reduce nonresponse bias, replacing missing values for the variables in the core BRFSS questionnaire including all study outcomes and covariates [3–6] (replication code is available from the authors). Item response missingness for the imputed variables is shown in Exhibit S14.

Data from 2011-2013 were included to capture trends prior to implementation of ACA Medicaid expansion and the subsidized exchanges. Prior to 2011, BRFSS used a different sampling strategy and data are not comparable. 2015 was the most recent year of data available. Respondents aged 65+ were removed as the Medicare-eligible population was not a target of the ACA reforms. Respondents from U.S. territories were excluded.

### Regression models used in the analysis

Our analysis was based on two types of regression models: adjusted pre/post or “first differences” models and adjusted difference-in-differences or “double differences” models.

We used pre/post “first differences” models to quantify the aggregate change in outcomes from 2013 to 2015, controlling for longer run trends and observed covariates. Stratifying by whether a state expanded Medicaid, we estimated models of the form:

$$(1) \quad E[Y_{ist}] = \alpha_s + \beta_1 Year.2014_t + \beta_2 Year.2015_t + \gamma_s Quarter_t + \delta X_{ist}$$

where  $\alpha_s$  are state fixed effects,  $\gamma_s$  are state-specific time trends,  $X_{ist}$  is a vector of

observed characteristics and  $\delta$  the coefficient vector.  $Year.2014_t$  and  $Year.2015_t$  are indicator variables for whether the respondent was interviewed in 2014 or 2015. The period 2011-2013 is the reference group.  $\beta_1$  and  $\beta_2$  are thus our regression-adjusted estimates of the changes in outcomes associated with the first year of the ACA rollout (2014) and second year (2015). We report estimates for  $\beta_2$  as our main result as implementation was slow in some states in the first year.

The difference in outcomes associated with Medicaid expansion is the difference between  $\beta_2$  estimated for individuals living in expansion states and  $\beta_2$  estimated for individuals in non-expansion states. This “difference-in-differences” can be estimated in a single regression model, in which, as before, we control for observed covariates and state-specific trends. We estimated difference-in-difference models of the form:

$$(2) \quad E[Y_{ist}] = \alpha_s + \beta_1 Year.2014_t + \beta_2 Year.2015_t + \beta_3 Year.2014_t * expansion_s + \beta_4 Year.2015_t * expansion_s + \gamma_s Quarter_t + \delta X_{ist}$$

where  $\beta_3$  and  $\beta_4$  are the difference-in-differences estimators for the effect of Medicaid expansion in the first and second year of the rollout.

As described in the main text, all regression models were estimated as linear probability models with BRFSS sampling weights [7] and clustered standard errors at the state level to account for intrastate correlation [8]. Linear probability models are commonly used in difference-in-differences analyses because the coefficient of interest captures changes on a risk difference scale. Additionally, all models were stratified by socioeconomic variables, enabling assessment of differential trends by household income, educational attainment, homeownership, and employment status.

In addition to the above models, to measure changes in health access gaps we estimated linear probability difference-in-differences models, interacting socioeconomic categories with the post-policy indicator. Specifically, absolute (percentage point) changes in health gaps between 2013 and 2015 and 95% CI's for these changes were estimated as  $\beta_3$  in the regression equation

$$(3) \quad E[Y_i] = \beta_0 + \beta_1 Year2015_i + \beta_2 HighSES_i + \beta_3 Year2015_i * HighSES_i$$

where Year2015 is an indicator equal to 1 if year is 2015 and 0 if year is 2013 and HighSES is an indicator equal to 0 if the respondent is in a low SES category and 1 if the respondent is in a high SES category. Relative percent changes from 2013 to 2015 were estimated as Absolute Change / 2013 Gap.

## References

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- bias in the Behavioral Risk Factor Surveillance System (BRFSS). *J Epidemiol Community Heal.* 2012;66: 290–295. doi:10.1136/jech.2009.103861
4. Andridge RR, Little RJA. A Review of Hot Deck Imputation for Survey Non-response. *Int Stat Rev.* 2010;78: 40–64. doi:10.1111/j.1751-5823.2010.00103.x
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  7. Centers for Disease Control and Prevention, Behavioral Risk Factor Surveillance System. Weighting BRFSS data. 2013.
  8. Bertrand M, Duflo E, Mullainathan S. How much should we trust differences-in-differences estimates? *Q J Econ.* 2004;119: 249–275.

## APPENDIX B. SUPPLEMENTARY EXHIBITS

### Appendix Exhibit S1. Sample characteristics

Sample Demographics	Expansion States			Non-Expansion States		
	N	%	Wtd %	N	%	Wtd %
Female	390,877	56.5	50.1	369,082	58.0	50.3
Married	403,518	58.4	52.9	383,763	60.3	53.8
Children in household	262,170	37.9	55.0	246,692	38.8	55.2
Age Group						
18-24	54,070	7.8	15.9	50,273	7.9	16.2
25-29	45,652	6.6	10.0	43,564	6.8	10.2
30-34	55,067	8.0	11.1	52,723	8.3	11.3
35-39	59,097	8.5	9.6	55,366	8.7	9.6
40-44	67,617	9.8	10.9	61,136	9.6	11.1
45-49	78,360	11.3	9.9	69,911	11.0	9.8
50-54	101,212	14.6	12.5	91,454	14.4	12.2
55-59	113,625	16.4	10.4	102,741	16.1	9.8
60-64	116,681	16.9	9.7	109,229	17.2	9.8
Race/Ethnicity						
White	588,624	85.1	77.8	520,088	81.7	74.0
Black	44,784	6.5	9.4	78,273	12.3	18.0
American Indian/Alaskan Native	18,139	2.6	4.0	11,893	1.9	2.1
Asian	11,115	1.6	4.4	5,770	0.9	1.8
Hawaiian/Pacific Islander	8,657	1.3	1.3	6,810	1.1	1.0
No preferred race/Other/Multi	20,062	2.9	3.4	13,563	2.1	3.1
Educational Attainment						
Less than high school	47,403	6.9	13.8	50,602	8.0	14.9
High school grad	184,291	26.7	27.6	179,182	28.2	28.8
Some college	196,011	28.4	31.7	186,694	29.3	31.9
College graduate	263,676	38.1	26.9	219,919	34.6	24.5
Income Group						
<\$10,000	40,074	5.8	7.2	39,108	6.1	6.9
\$10,000 to <\$15,000	34,547	5.0	5.6	34,895	5.5	5.7
\$15,000 to <\$20,000	44,539	6.4	7.2	46,499	7.3	8.6
\$20,000 to <\$25,000	53,910	7.8	8.2	55,051	8.7	9.8
\$25,000 to <\$35,000	65,038	9.4	9.7	65,472	10.3	10.8
\$35,000 to <\$50,000	93,596	13.5	13.1	92,208	14.5	14.0
\$50,000 to <\$75,000	116,858	16.9	15.8	108,267	17.0	15.3
>\$75,000	242,819	35.1	33.2	194,897	30.6	28.9
Employment Status						
Employed	462,271	66.9	65.7	419,696	65.9	65.2
Unemployed	50,077	7.2	8.8	42,194	6.6	8.5
Not in labor force	179,033	25.9	25.5	174,507	27.4	26.3
Homeownership Status						
Renter	213,270	30.8	36.0	189,623	29.8	34.7
Homeowner	478,111	69.2	64.0	446,774	70.2	65.3

Note: Table displays frequencies (N), percentages (%), and weighted percentages (wtd %) estimated using BRFSS sampling weights. Percentages may not sum to 100 due to rounding.

**Appendix Exhibit S2. Changes in Insurance Coverage under the Affordable Care Act**

<i>Panel A. Percent Insured, 2013-2015</i>	Strata	2013 Percent		2014 Percent		2015 Percent	
		Expansion	Non-Expansion	Expansion	Non-Expansion	Expansion	Non-Expansion
Household Income (BRFSS Categories)	<\$10,000	65.2	53.2	73.8	55.8	80.6	62.1
	\$10,000 to <\$15,000	63.3	55.1	72.1	62.4	79.3	65.7
	\$15,000 to <\$20,000	60.2	51.5	70.9	58.5	77.0	61.9
	\$20,000 to <\$25,000	63.9	59.1	75.1	64.6	78.2	68.3
	\$25,000 to <\$35,000	73.4	66.8	78.6	73.6	83.0	75.4
	\$35,000 to <\$50,000	82.0	79.6	85.9	82.6	87.4	81.7
	\$50,000 to <\$75,000	89.3	86.7	91.6	88.3	91.1	88.2
	>\$75,000	94.1	91.3	94.7	92.5	95.3	92.8
Household Poverty	\$0-\$25,000	63.2	55.0	73.1	60.5	78.7	64.7
	>\$25,000	88.1	83.9	90.3	86.8	91.5	87.1
Educational Attainment	Not college graduate	76.6	69.8	82.0	74.3	85.2	76.2
	College graduate	92.7	90.6	94.6	92.8	96.1	94.0
Employment Status	Unemployed	58.3	46.5	69.5	52.6	77.3	56.5
	Employed	83.2	77.4	86.4	81.0	88.7	83.1
Home Ownership	Renter	69.8	61.2	76.2	66.8	81.2	70.7
	Homeowner	87.1	81.9	90.6	85.3	92.3	86.3
	Full Sample	80.9	74.8	85.4	78.8	88.2	80.7

Source: BRFSS 2013-2015.

Notes: Panel displays the percent of the population that has insurance coverage, stratified by socioeconomic category, year, and residence in a Medicaid expansion state (defined in text). Data are weighted using BRFSS survey weights.

**Appendix Exhibit S2, Insurance Coverage, cont'd.**

<i>Panel B. Changes in Insurance Coverage</i>	Strata	Δ 2013 to 2015, Expansion States				Δ 2013 to 2015, Non-expansion States			
		<i>Crude</i>		<i>Adjusted</i>		<i>Crude</i>		<i>Adjusted</i>	
		Beta	SE	Beta	SE	Beta	SE	Beta	SE
Household Income (BRFSS Categories)	<\$10,000	15.0***	1.45	13.0***	2.28	9.0***	1.73	7.3**	2.59
	\$10,000 to <\$15,000	16.0***	1.61	15.0***	2.51	11.0***	1.79	7.1**	2.71
	\$15,000 to <\$20,000	17.0***	1.37	18.0***	2.15	10.0***	1.52	10.0***	2.28
	\$20,000 to <\$25,000	14.0***	1.26	14.0***	1.91	9.1***	1.41	9.5***	2.15
	\$25,000 to <\$35,000	9.6***	1.04	10.0***	1.65	8.7***	1.28	9.3***	2.01
	\$35,000 to <\$50,000	5.3***	0.8	5.5***	1.27	2.1*	0.97	0.1	1.51
	\$50,000 to <\$75,000	1.8**	0.6	3.6***	0.92	1.5	0.83	3.0*	1.24
	>\$75,000	1.2***	0.32	1.9***	0.52	1.5***	0.47	2.1**	0.75
Household Poverty	\$0-\$25,000	16.0***	0.7	15.0***	1.10	9.7***	0.80	8.8***	1.20
	>\$25,000	3.4***	0.29	4.1***	0.46	3.1***	0.40	3.4***	0.62
Educational Attainment	Not college graduate	8.6***	0.38	9.4***	0.60	6.4***	0.48	6.3***	0.74
	College graduate	3.3***	0.28	3.2***	0.47	3.3***	0.37	3.4***	0.62
Employment Status	Unemployed	19.0***	1.33	17.0***	1.98	10.0***	1.56	6.8**	2.30
	Employed	5.5***	0.34	6.9***	0.53	5.7***	0.45	6.7***	0.68
Home Ownership	Renter	11.0***	0.54	11.0***	0.88	9.5***	0.67	8.4***	1.06
	Homeowner	5.3***	0.33	5.5***	0.52	4.4***	0.44	3.8***	0.68
	Full Sample	7.3***	0.29	7.4***	0.46	5.8***	0.38	5.3***	0.59

*Source: BRFSS, 2011-2015*

Notes: Table displays weighted least squares regression results. Columns display crude and adjusted “first differences” estimates of the change over time (2013 to 2015) in the percent with insurance coverage. Regression estimates are stratified by socioeconomic category, year, and residence in a Medicaid expansion state. Adjusted models adjust for state-specific linear trends and observed covariates unlikely to be affected by the ACA. Standard errors are adjusted for clustering at the state level. BRFSS sampling weights are used. \*p<0.5 \*\*p<0.01 \*\*\*p<0.001

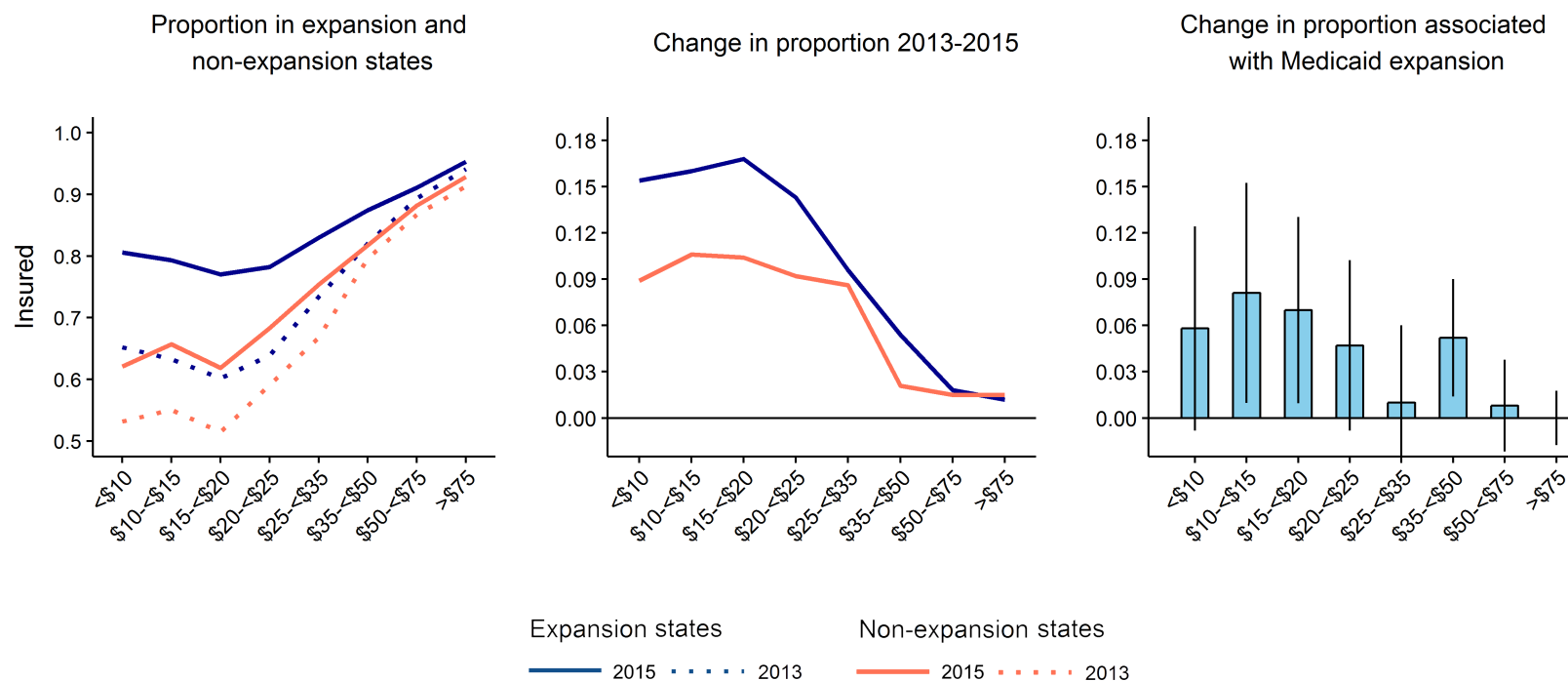
**Appendix Exhibit S2, Insurance Coverage, cont'd.**

<i>Panel C. Change Associated with Medicaid Expansion</i>	Strata	Change associated with Medicaid Expansion (Difference in Differences): 2014				Change associated with Medicaid Expansion (Difference in Differences): 2015			
		<i>Crude</i>		<i>Adjusted</i>		<i>Crude</i>		<i>Adjusted</i>	
		Beta	SE	Beta	SE	Beta	SE	Beta	SE
Household Income (BRFSS Categories)	<\$10,000	6.0**	2.19	6.8**	2.60	6.4**	2.23	5.8	3.38
	\$10,000 to <\$15,000	1.5	2.39	3.6	2.82	5.5*	2.38	8.1*	3.64
	\$15,000 to <\$20,000	3.7	1.99	4.4	2.37	6.4***	2.02	7.0*	3.08
	\$20,000 to <\$25,000	5.8***	1.82	4.5*	2.12	5.2**	1.86	4.7	2.82
	\$25,000 to <\$35,000	-1.6	1.61	-0.8	1.93	1.0	1.63	1.0	2.55
	\$35,000 to <\$50,000	0.8	1.19	2.3	1.45	3.2**	1.24	5.2**	1.94
	\$50,000 to <\$75,000	0.6	0.95	0.8	1.12	0.2	1.01	0.8	1.52
	>\$75,000	-0.6	0.56	-0.6	0.68	-0.3	0.56	0.0	0.90
Household Poverty	\$0-\$25,000	4.4***	1.04	4.9***	1.22	5.8***	1.05	6.3***	1.60
	>\$25,000	-0.2	0.48	-0.2	0.57	0.3	0.48	0.8	0.75
Educational Attainment	Not college graduate	0.9*	0.44	1.7*	0.71	2.1***	0.45	3.2***	0.93
	College graduate	-0.4	0.34	-0.4	0.59	0.0	0.33	-0.3	0.77
Employment Status	Unemployed	5.1*	2.01	6.2**	2.31	9.0***	2.03	11.0***	2.98
	Employed	-0.4	0.56	0.1	0.64	-0.2	0.56	0.1	0.85
Home Ownership	Renter	0.8	0.86	1.8	1.03	1.9*	0.85	2.8*	1.34
	Homeowner	0.1	0.54	0.6	0.64	0.9	0.55	1.5	0.84
	Full Sample	0.5	0.47	1.1	0.55	1.4**	0.47	2.2**	0.73

Source: BRFSS, 2011-2015

Notes: Table displays weighted least squares regression results. Columns display both crude and adjusted differences-in-differences estimates of the change in insurance coverage associated with Medicaid expansion. All estimates control for secular trends affecting all states. Adjusted models additionally control for state-specific linear trends and observed covariates unlikely to be affected by the ACA. Standard errors are adjusted for clustering at the state level. BRFSS sampling weights are used. \*p<0.5 \*\*p<0.01 \*\*\*p<0.001

### Appendix Exhibit S3. Changes in insurance coverage with ACA Medicaid Expansion, by income group.



Notes: Exhibit displays changes in insurance coverage by income group, shown in 000s of \$US dollars. In each exhibit, the left panel shows the outcome by income group in expansion states in 2013 (broken blue) and 2015 (solid blue) and in non-expansion states in 2013 (broken red) and 2015 (solid red). The middle panel shows the change in the outcome between 2013 and 2015 in expansion states (blue) and non-expansion states (red). The right panel shows the change in the outcome associated with Medicaid expansion, estimated in adjusted difference-in-differences models (Exhibit 1). 95% confidence intervals, adjusted for state-level clustering, are shown.



**Appendix Exhibit S4. Changes in Percent with a Primary Care Provider under the Affordable Care Act**

<i>Panel A. Percent with a Primary Care Provider, 2013-2015</i>	Strata	2013 Percent		2014 Percent		2015 Percent	
		Expansion	Non-Expansion	Expansion	Non-Expansion	Expansion	Non-Expansion
Household Income (BRFSS Categories)	<\$10,000	59.8	56.0	65.3	59.7	69.4	60.6
	\$10,000 to <\$15,000	60.3	58.7	64.3	61.5	67.5	63.8
	\$15,000 to <\$20,000	60.3	55.1	63.8	57.2	66.1	58.1
	\$20,000 to <\$25,000	62.9	59.4	65.4	57.8	69.6	61.0
	\$25,000 to <\$35,000	65.8	62.6	67.9	64.3	70.7	65.0
	\$35,000 to <\$50,000	72.3	70.8	74.8	69.8	75.0	70.1
	\$50,000 to <\$75,000	79.8	76.0	79.0	74.8	79.1	75.3
	>\$75,000	84.2	79.6	83.6	79.6	83.6	79.3
Household Poverty	\$0-\$25,000	60.9	57.4	64.7	58.7	68.2	60.6
	>\$25,000	78.6	74.3	78.9	74.3	79.5	74.5
Educational Attainment	Not college graduate	70.5	65.9	72.5	66.4	74.2	67.4
	College graduate	81.7	78.6	81.2	79.4	82.9	79.9
Employment Status	Unemployed	60.1	53.5	63.5	55.1	67.3	57.1
	Employed	73.7	68.6	74.3	68.9	75.9	69.8
Home Ownership	Renter	59.6	53.1	61.9	55.4	65.1	56.8
	Homeowner	81.2	77.2	82.2	77.3	83.4	78.3
	Full Sample	73.5	69.0	74.9	69.6	76.6	70.5

*Source: BRFSS 2013-2015.*

Notes: Panel displays the percent of the population that has a primary care provider / personal doctor, stratified by socioeconomic category, year, and residence in a Medicaid expansion state (defined in text). Data are weighted using BRFSS survey weights.

**Appendix Exhibit S4, Primary Care Provider, cont'd.**

<i>Panel B. Changes in Having a Primary Care Provider</i>		Δ 2013 to 2015, Expansion States				Δ 2013 to 2015, Non-expansion States			
		<i>Crude</i>		<i>Adjusted</i>		<i>Crude</i>		<i>Adjusted</i>	
		Beta	SE	Beta	SE	Beta	SE	Beta	SE
Household Income (BRFSS Categories)	<\$10,000	9.6***	1.60	9.8***	2.4	4.5**	1.73	6.6**	2.53
	\$10,000 to <\$15,000	7.2***	1.75	7.1**	2.57	5.0**	1.79	3.7	2.66
	\$15,000 to <\$20,000	5.8***	1.45	6.5**	2.2	3.0*	1.52	3.5	2.24
	\$20,000 to <\$25,000	6.7***	1.33	7.1***	1.93	1.6	1.42	3.3	2.11
	\$25,000 to <\$35,000	4.8***	1.17	9.1***	1.74	2.5	1.31	5.4**	1.96
	\$35,000 to <\$50,000	2.7**	0.98	5.6***	1.49	-0.8	1.07	2.5	1.58
	\$50,000 to <\$75,000	-0.7	0.77	1.8	1.13	-0.7	0.95	2.6	1.38
	>\$75,000	-0.6	0.48	1.9**	0.73	-0.3	0.65	2.2*	0.98
Household Poverty	\$0-\$25,000	7.3***	0.76	7.7***	1.12	3.2***	0.8	4.1***	1.18
	>\$25,000	0.9*	0.37	3.7***	0.56	0.3	0.46	3.1***	0.68
Educational Attainment	Not college graduate	3.7***	0.44	6.0***	0.66	1.5**	0.5	3.6***	0.74
	College graduate	1.2*	0.45	2.5***	0.67	1.3*	0.56	3.8***	0.84
Employment Status	Unemployed	7.1***	1.42	9.0***	2.05	3.6*	1.58	4.9*	2.32
	Employed	2.2***	0.41	4.8***	0.61	1.2*	0.49	4.0***	0.72
Home Ownership	Renter	5.5***	0.6	7.4***	0.94	3.7***	0.69	5.9***	1.07
	Homeowner	2.2***	0.41	3.8***	0.61	1.1*	0.49	2.3***	0.72
Full Sample		3.1***	0.35	4.8***	0.52	1.6***	0.41	3.4***	0.61

Source: BRFSS, 2011-2015

Notes: Table displays weighted least squares regression results. Columns display crude and adjusted “first differences” estimates of the change over time (2013 to 2015) in the percent with a primary care provider / doctor. Regression estimates are stratified by socioeconomic category, year, and residence in a Medicaid expansion state. Adjusted models adjust for state-specific linear trends and observed covariates unlikely to be affected by the ACA. Standard errors are adjusted for clustering at the state level. BRFSS sampling weights are used. \*p<0.5 \*\*p<0.01 \*\*\*p<0.001

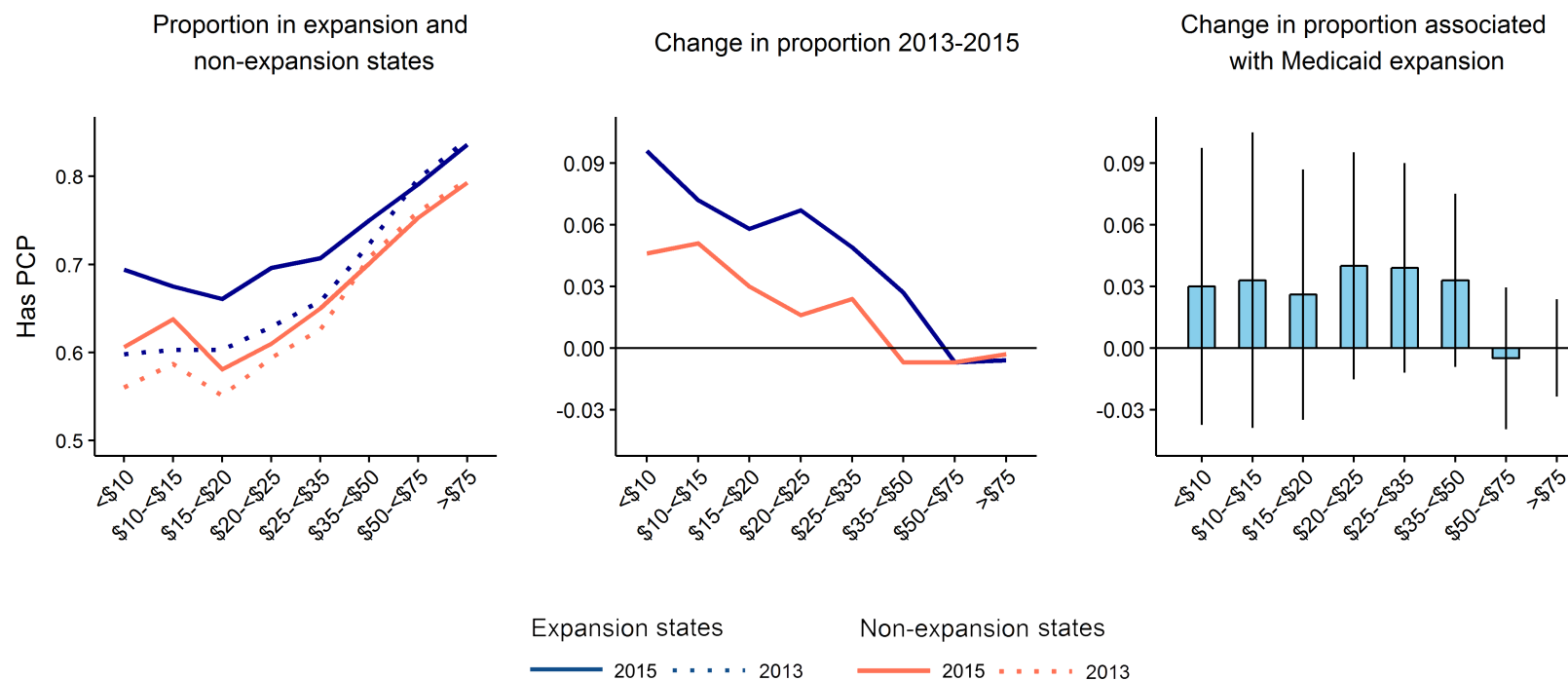
**Appendix Exhibit S4, Primary Care Provider, cont'd.**

<i>Panel C. Change Associated with Medicaid Expansion</i>	Strata	Change associated with Medicaid Expansion (Difference in Differences): 2014				Change associated with Medicaid Expansion (Difference in Differences): 2015			
		Crude		Adjusted		Crude		Adjusted	
		Beta	SE	Beta	SE	Beta	SE	Beta	SE
Household Income (BRFSS Categories)	<\$10,000	1.8	2.26	0.8	2.60	5.1*	2.33	3.0	3.44
	\$10,000 to <\$15,000	1.2	2.44	2.0	2.76	2.1	2.48	3.3	3.67
	\$15,000 to <\$20,000	1.4	2.01	1.5	2.36	2.8	2.07	2.6	3.11
	\$20,000 to <\$25,000	4.1*	1.88	3.3	2.12	5.1**	1.92	4.0	2.82
	\$25,000 to <\$35,000	0.4	1.71	0.8	1.97	2.4	1.74	3.9	2.60
	\$35,000 to <\$50,000	3.6*	1.41	3.3*	1.63	3.5*	1.44	3.3	2.15
	\$50,000 to <\$75,000	0.4	1.16	-0.3	1.34	0.0	1.21	-0.5	1.76
	>\$75,000	-0.6	0.79	-0.4	0.92	-0.3	0.8	0.0	1.21
Household Poverty	\$0-\$25,000	2.5*	1.06	2.2	1.22	4.1***	1.09	3.6*	1.61
	>\$25,000	0.6	0.56	0.3	0.66	0.7	0.58	0.8	0.87
Educational Attainment	Not college graduate	1.5***	0.48	1.6*	0.74	2.2***	0.49	2.5**	0.98
	College graduate	-1.4**	0.51	-1.7*	0.82	-0.2	0.5	-1.2	1.07
Employment Status	Unemployed	1.8	2.05	1.9	2.34	3.5	2.1	4.5	3.07
	Employed	0.4	0.63	0.4	0.71	1.0	0.63	0.9	0.93
Home Ownership	Renter	0.0	0.9	0.3	1.07	1.8*	0.9	1.6	1.41
	Homeowner	0.9	0.61	1.0	0.70	1.1	0.63	1.3	0.93
	Full Sample	0.8	0.52	0.8	0.59	1.5**	0.53	1.6*	0.78

*Source: BRFSS, 2011-2015*

Notes: Table displays crude and adjusted differences-in-differences regression estimates of the change in having a primary care provider associated with Medicaid expansion. All estimates control for secular trends affecting all states. Adjusted models additionally control for state-specific linear trends and observed covariates unlikely to be affected by the ACA. Standard errors are adjusted for clustering at the state level. BRFSS sampling weights are used. \*p<0.5 \*\*p<0.01 \*\*\*p<0.001

# Appendix Exhibit S5. Changes in having a primary care provider with ACA Medicaid Expansion, by income group.



Notes: Exhibit displays changes in having a primary care provider by income group, shown in 000s of \$US dollars. In each exhibit, the left panel shows the outcome by income group in expansion states in 2013 (broken blue) and 2015 (solid blue) and in non-expansion states in 2013 (broken red) and 2015 (solid red). The middle panel shows the change in the outcome between 2013 and 2015 in expansion states (blue) and non-expansion states (red). The right panel shows the change in the outcome associated with Medicaid expansion, estimated in adjusted difference-in-differences models. 95% confidence intervals, adjusted for state-level clustering, are shown.

**Appendix Exhibit S6. Changes in Avoiding Care Due to Cost under the Affordable Care Act**

<i>Panel A. Percent Avoiding Care Due to Cost, 2013-2015</i>	Strata	2013 Percent		2014 Percent		2015 Percent	
		Expansion	Non-Expansion	Expansion	Non-Expansion	Expansion	Non-Expansion
Household Income (BRFSS Categories)	<\$10,000	31.7	40.2	28.5	37.9	24.0	32.4
	\$10,000 to <\$15,000	34.3	41.5	27.4	35.5	24.0	32.9
	\$15,000 to <\$20,000	31.5	37.3	28.1	34.1	24.0	32.5
	\$20,000 to <\$25,000	29.9	32.7	25.4	29.8	21.6	29.2
	\$25,000 to <\$35,000	23.2	23.6	21.1	22.4	18.3	21.1
	\$35,000 to <\$50,000	17.4	18.2	14.9	15.8	15.2	17.1
	\$50,000 to <\$75,000	11.4	12.2	10.4	11.3	10.8	12.3
	>\$75,000	5.7	7.9	5.9	7.4	6.0	7.4
Household Poverty	\$0-\$25,000	31.6	37.3	27.3	33.9	23.3	31.4
	>\$25,000	11.4	13.5	10.5	12.2	10.2	12.4
Educational Attainment	Not college graduate	20.2	24.3	18.0	21.7	15.9	20.8
	College graduate	9.0	10.6	8.1	9.8	7.2	9.1
Employment Status	Unemployed	33.4	40.0	28.4	35.7	24.9	33.0
	Employed	14.8	17.9	13.3	15.9	11.8	15.1
Home Ownership	Renter	25.6	30.5	22.8	27.2	19.0	24.5
	Homeowner	12.6	16.0	11.0	14.2	10.3	14.1
	Full Sample	17.2	21.0	15.3	18.8	13.6	17.9

*Source: BRFSS 2013-2015.*

Notes: Panel displays the percent of the population avoiding care due to cost, stratified by socioeconomic category, year, and residence in a Medicaid expansion state (defined in text). Data are weighted using BRFSS survey weights.

**Appendix Exhibit S6, Avoiding Care, cont'd.**

<i>Panel B. Changes in Avoiding Care Due to Cost</i>		Δ 2013 to 2015, Expansion States				Δ 2013 to 2015, Non-expansion States			
		<i>Crude</i>		<i>Adjusted</i>		<i>Crude</i>		<i>Adjusted</i>	
		Beta	SE	Beta	SE	Beta	SE	Beta	SE
Household Income (BRFSS Categories)	<\$10,000	-7.8***	1.46	-7.8***	2.29	-7.8***	1.64	-6.2*	2.52
	\$10,000 to <\$15,000	-10.0***	1.60	-7.7**	2.53	-8.6***	1.74	-6.1*	2.72
	\$15,000 to <\$20,000	-7.4***	1.30	-7.4***	2.04	-4.8***	1.45	-3.6	2.24
	\$20,000 to <\$25,000	-8.3***	1.21	-7.0***	1.89	-3.5**	1.33	-1.0	2.08
	\$25,000 to <\$35,000	-4.9***	0.98	-3.3*	1.56	-2.5*	1.06	-0.7	1.72
	\$35,000 to <\$50,000	-2.1**	0.79	-2.1	1.22	-1.1	0.9	-0.5	1.36
	\$50,000 to <\$75,000	-0.6	0.59	-1.1	0.91	0.1	0.73	0.9	1.15
	>\$75,000	0.3	0.30	0.2	0.48	-0.5	0.43	-1.3	0.69
Household Poverty	\$0-\$25,000	-8.4***	0.69	-7.5***	1.08	-5.8***	0.76	-4.0***	1.18
	>\$25,000	-1.2***	0.27	-1.1**	0.43	-1.1***	0.35	-0.9	0.55
Educational Attainment	Not college graduate	-4.3***	0.36	-4.1***	0.57	-3.5***	0.43	-2.5***	0.68
	College graduate	-1.8***	0.33	-1.5**	0.53	-1.5***	0.4	-1.4*	0.63
Employment Status	Unemployed	-8.4***	1.34	-7.4***	2.01	-7.0***	1.5	-3.9	2.35
	Employed	-2.9***	0.32	-3.1***	0.50	-2.7***	0.39	-2.7***	0.62
Home Ownership	Renter	-6.6***	0.51	-5.4***	0.83	-6.0***	0.61	-3.6***	0.99
	Homeowner	-2.2***	0.33	-2.0***	0.51	-1.9***	0.41	-1.2	0.63
Full Sample		-3.7***	0.28	-3.1***	0.44	-3.1***	0.34	-2.0***	0.54

*Source: BRFSS, 2011-2015*

Notes: Table displays weighted least squares regression results. Columns display crude and adjusted “first differences” estimates of the change over time (2013 to 2015) in the percent avoiding care due to cost. Regression estimates are stratified by socioeconomic category, year, and residence in a Medicaid expansion state. Adjusted models adjust for state-specific linear trends and observed covariates unlikely to be affected by the ACA. Standard errors are adjusted for clustering at the state level. BRFSS sampling weights are used. \*p<0.5 \*\*p<0.01 \*\*\*p<0.001

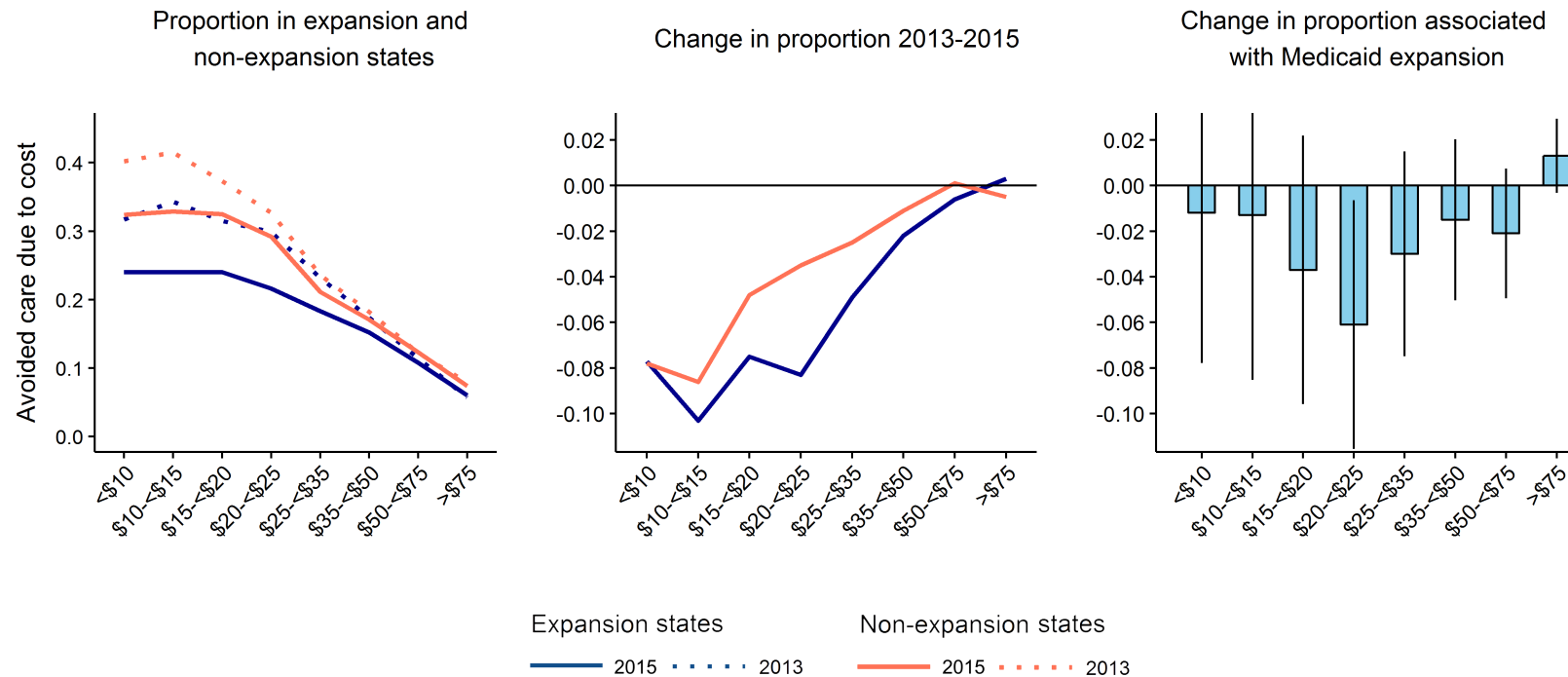
**Appendix Exhibit S6, Avoiding Care, cont'd.**

Panel C. Change Associated with Medicaid Expansion	Strata	Change associated with Medicaid Expansion (Difference in Differences): 2014				Change associated with Medicaid Expansion (Difference in Differences): 2015			
		Crude		Adjusted		Crude		Adjusted	
		Beta	SE	Beta	SE	Beta	SE	Beta	SE
Household Income (BRFSS Categories)	<\$10,000	-1.0	2.12	-2.8	2.55	0.0	2.17	-1.2	3.36
	\$10,000 to <\$15,000	-0.8	2.29	-0.4	2.78	-1.6	2.33	-1.3	3.68
	\$15,000 to <\$20,000	-0.1	1.88	-1.2	2.28	-2.6	1.92	-3.7	3.00
	\$20,000 to <\$25,000	-1.6	1.69	-1.5	2.05	-4.8**	1.77	-6.1*	2.78
	\$25,000 to <\$35,000	-1.0	1.45	-1.0	1.77	-2.4	1.42	-3.0	2.29
	\$35,000 to <\$50,000	0.0	1.12	-0.4	1.36	-1.0	1.18	-1.5	1.80
	\$50,000 to <\$75,000	-0.1	0.88	-0.7	1.08	-0.7	0.93	-2.1	1.45
	>\$75,000	0.7	0.5	1.0	0.62	0.8	0.52	1.3	0.83
Household Poverty	\$0-\$25,000	-0.9	0.98	-1.5	1.19	-2.5*	1.01	-3.5*	1.58
	>\$25,000	0.3	0.43	0.3	0.52	-0.1	0.44	-0.4	0.69
Educational Attainment	Not college graduate	0.3	0.4	-0.1	0.66	-0.8	0.41	-1.6	0.88
	College graduate	-0.1	0.36	0.0	0.62	-0.3	0.36	-0.1	0.81
Employment Status	Unemployed	-0.7	1.95	-1.9	2.33	-1.4	1.99	-3.5	3.06
	Employed	0.4	0.49	0.3	0.59	-0.2	0.5	-0.5	0.78
Home Ownership	Renter	0.5	0.8	-0.3	0.97	-0.6	0.78	-1.8	1.27
	Homeowner	0.2	0.5	0.0	0.60	-0.3	0.52	-0.8	0.80
	Full Sample	0.2	0.43	0.0	0.52	-0.6	0.44	-1.2	0.69

Source: BRFSS, 2011-2015

Notes: Table displays crude and adjusted differences-in-differences regression estimates of the change in avoiding care due to cost associated with Medicaid expansion. All estimates control for secular trends affecting all states. Adjusted models additionally control for state-specific linear trends and observed covariates unlikely to be affected by the ACA. Standard errors are adjusted for clustering at the state level. BRFSS sampling weights are used. \*p<0.5 \*\*p<0.01 \*\*\*p<0.001

## Appendix Exhibit S7. Changes in avoiding care due to cost with ACA Medicaid Expansion, by income group.



Notes: Exhibit displays changes in avoiding care due to cost by income group, shown in 000s of \$US dollars. In each exhibit, the left panel shows the outcome by income group in expansion states in 2013 (broken blue) and 2015 (solid blue) and in non-expansion states in 2013 (broken red) and 2015 (solid red). The middle panel shows the change in the outcome between 2013 and 2015 in expansion states (blue) and non-expansion states (red). The right panel shows the change in the outcome associated with Medicaid expansion, estimated in adjusted difference-in-differences models (Exhibit 1). 95% confidence intervals, adjusted for state-level clustering, are shown.



**Appendix Exhibit S8. Sensitivity Analysis. Regression-adjusted changes in health care access under the ACA for different socioeconomic groups, excluding States Expanding Medicaid during 2014/2015**

	Strata	Insurance Coverage			Has PCP			Avoided Care Due to Cost		
		Change 2013 to 2015		Change assoc. with Medicaid expansion	Change 2013 to 2015		Change assoc. with Medicaid expansion	Change 2013 to 2015		Change assoc. with Medicaid expansion
		Medicaid expansion states	Non-expansion states		Medicaid expansion states	Non-expansion states		Medicaid expansion states	Non-expansion states	
Household Income (BRFSS Categories)	<\$10,000	13.0***	7.3**	5.7	12.0***	6.7**	5.0	-8.6***	-1.9	-1.9
	\$10,000 to <\$15,000	18.0***	7.1**	10.0**	7.9**	3.7	3.8	-8.0**	-1.5	-1.5
	\$15,000 to <\$20,000	19.0***	10.0***	8.2*	5.3*	3.5	1.4	-6.5**	-2.7	-2.7
	\$20,000 to <\$25,000	17.0***	9.5***	7.1*	9.5***	3.3	6.3*	-7.8***	-7.0*	-7.0*
	\$25,000 to <\$35,000	11.0***	9.3***	1.6	9.5***	5.4**	4.3	-4.6*	-4.4	-4.4
	\$35,000 to <\$50,000	6.1***	0.1	5.9**	6.3***	2.6	3.8	-3.1*	-2.6	-2.6
	\$50,000 to <\$75,000	4.6***	3.0*	1.7	2.3	2.5	0.1	-2.7*	-3.7*	-3.7*
	>\$75,000	1.9***	2.1**	0.0	2.1*	2.2*	0.2	-0.2	0.9	0.9
Household Poverty	\$0-\$25,000	17.0***	8.8***	7.8***	8.8***	4.1***	4.6**	-7.8***	-3.8*	-3.8*
	>\$25,000	4.5***	3.4***	1.2	4.0***	3.1***	1.1	-1.9***	-1.2	-1.2
Educational Attainment	Not college graduate	10.0***	6.3***	4.1***	6.8***	3.6***	3.3**	-5.0***	-2.5**	-2.5**
	College graduate	3.5***	3.4***	0.1	2.8***	3.8***	-1.0	-1.6*	-0.2	-0.2
Employment Status	Unemployed	18.0***	6.8**	12.0***	9.2***	4.8*	4.6	-7.1**	-3.2	-1.3
	Employed	7.3***	6.7***	0.5	5.3***	4.0***	1.4	-3.9***	-1.3	-3.2
Home Ownership	Renter	12.0***	8.4***	3.5*	8.0***	5.9***	2.2	-5.6***	-2	-2.0
	Homeowner	6.1***	3.8***	2.1*	4.3***	2.3***	1.8	-2.9***	-1.7	-1.7
	Full Sample	8.2***	5.3***	2.9***	5.4***	3.4***	2.1*	-3.8***	-1.8*	-1.8*

Source: BRFSS 2011-2015.

Note: Exhibit presents data identical to Exhibit 3 in the main text, except for the exclusion of those states that expanded Medicaid after 1 January 2014: Michigan (4/1/2014), New Hampshire (8/15/2014), Pennsylvania (1/1/2015), Indiana (2/1/2015), Alaska (9/1/2015), and Montana (1/1/2016). Standard errors are adjusted for clustering at the state level; BRFSS survey weights are used.

\*p<0.05 \*\*p<0.01 \*\*\*p<0.001

**Appendix Exhibit S9. Sensitivity Analysis. Changes in Insurance Coverage, excluding States Expanding Medicaid during 2014/2015**

<i>Panel A. Percent Insured, 2013-2015</i>	Strata	2013 Percent		2014 Percent		2015 Percent	
		Expansion	Non-Expansion	Expansion	Non-Expansion	Expansion	Non-Expansion
Household Income (BRFSS Categories)	<\$10,000	64.5	53.1	73.6	55.6	79.5	64.5
	\$10,000 to <\$15,000	62.1	55.0	71.4	62.3	79.2	62.1
	\$15,000 to <\$20,000	59.3	51.4	70.4	58.5	76.9	59.3
	\$20,000 to <\$25,000	62.1	59.1	75.3	64.5	77.8	62.1
	\$25,000 to <\$35,000	72.5	66.7	78.5	73.5	82.3	72.5
	\$35,000 to <\$50,000	81.6	79.6	85.7	82.6	87.5	81.6
	\$50,000 to <\$75,000	89.0	86.7	91.6	88.4	91.3	89.0
	>\$75,000	94.2	91.3	94.6	92.5	95.5	94.2
Household Poverty	\$0-\$25,000	62.1	54.9	72.8	60.4	78.2	62.1
	>\$25,000	87.9	83.9	90.2	86.8	91.6	87.9
Educational Attainment	Not college graduate	75.9	69.7	81.7	74.2	84.9	75.9
	College graduate	92.6	90.6	94.5	92.8	96.2	92.6
Employment Status	Unemployed	58.4	46.4	70.5	52.4	78.1	58.4
	Employed	82.9	77.3	86.2	80.9	88.6	82.9
Home Ownership	Renter	69.3	61.1	76.0	66.7	80.9	69.3
	Homeowner	87.0	81.9	90.8	85.3	92.6	87.0
	Full Sample	80.4	74.8	85.2	78.7	88.1	80.4

*Source: BRFSS 2013-2015.*

Notes: Panel displays the percent of the population with insurance coverage, stratified by socioeconomic category, year, and residence in a Medicaid expansion state (defined in text). Analysis exclude states that expanded Medicaid after 1 January 2014: Michigan (4/1/2014), New Hampshire (8/15/2014), Pennsylvania (1/1/2015), Indiana (2/1/2015), Alaska (9/1/2015), and Montana (1/1/2016). Data are weighted using BRFSS survey weights.

**Appendix Exhibit S9, Sensitivity Analysis: Insurance Coverage, excluding late expanders, cont'd.**

<i>Panel B. Changes in Insurance Coverage</i>	Strata	Δ 2013 to 2015, Expansion States				Δ 2013 to 2015, Non-expansion States			
		<i>Crude</i>		<i>Adjusted</i>		<i>Crude</i>		<i>Adjusted</i>	
		Beta	SE	Beta	SE	Beta	SE	Beta	SE
Household Income (BRFSS Categories)	<\$10,000	15.0***	1.69	13.0***	2.66	9.0***	1.75	7.3**	2.59
	\$10,000 to <\$15,000	17.0***	1.85	18.0***	2.93	11.0***	1.81	7.1**	2.71
	\$15,000 to <\$20,000	18.0***	1.6	19.0***	2.53	10.0***	1.54	10.0***	2.28
	\$20,000 to <\$25,000	16.0***	1.48	17.0***	2.28	9.1***	1.43	9.5***	2.15
	\$25,000 to <\$35,000	9.8***	1.23	11.0***	1.97	8.7***	1.3	9.3***	2.01
	\$35,000 to <\$50,000	5.9***	0.93	6.1***	1.53	2.0*	0.98	0.1	1.51
	\$50,000 to <\$75,000	2.4***	0.71	4.6***	1.11	1.5	0.84	3.0*	1.24
	>\$75,000	1.3***	0.37	1.9***	0.61	1.5***	0.47	2.1**	0.75
Household Poverty	\$0-\$25,000	16.0***	0.82	17.0***	1.29	9.7***	0.81	8.8***	1.20
	>\$25,000	3.7***	0.33	4.5***	0.54	3.1***	0.4	3.4***	0.62
Educational Attainment	Not college graduate	9.1***	0.45	10.0***	0.72	6.4***	0.49	6.3***	0.74
	College graduate	3.6***	0.33	3.5***	0.55	3.3***	0.38	3.4***	0.62
Employment Status	Unemployed	20.0***	1.53	18.0***	2.32	9.9***	1.59	6.8**	2.30
	Employed	5.7***	0.4	7.3***	0.63	5.7***	0.46	6.7***	0.68
Home Ownership	Renter	12.0***	0.62	12.0***	1.01	9.5***	0.68	8.4***	1.06
	Homeowner	5.6***	0.39	6.1***	0.62	4.4***	0.45	3.8***	0.68
	Full Sample	7.7***	0.34	8.2***	0.55	5.8***	0.39	5.3***	0.59

*Source: BRFSS, 2011-2015*

Notes: Table displays weighted least squares regression results. Models exclude states that expanded Medicaid after 1 January 2014: Michigan (4/1/2014), New Hampshire (8/15/2014), Pennsylvania (1/1/2015), Indiana (2/1/2015), Alaska (9/1/2015), and Montana (1/1/2016). Columns display crude and adjusted “first differences” estimates of the change over time (2013 to 2015) in the percent with insurance coverage. Regression estimates are stratified by socioeconomic category, year, and residence in a Medicaid expansion state. Adjusted models adjust for state-specific linear trends and observed covariates unlikely to be affected by the ACA. Standard errors are adjusted for clustering at the state level. BRFSS sampling weights are used. \*p<0.5 \*\*p<0.01 \*\*\*p<0.001

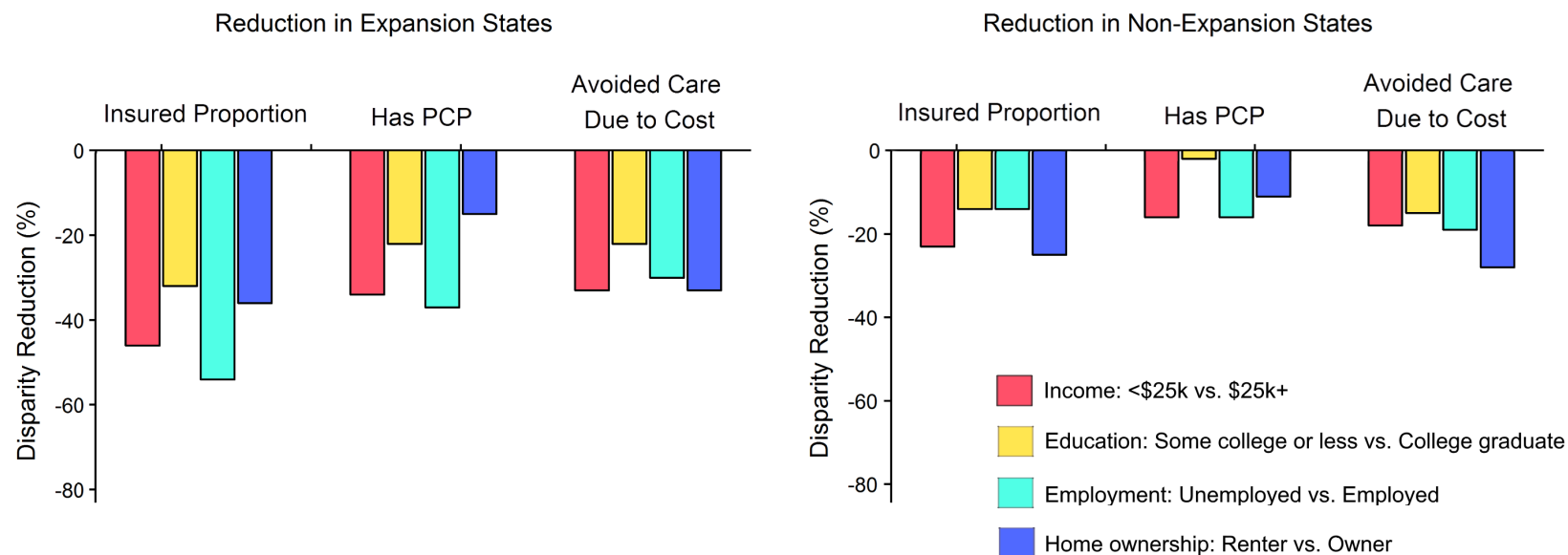
**Appendix Exhibit S9, Sensitivity Analysis: Insurance Coverage, excluding late expanders, cont'd.**

<i>Panel C. Change Associated with Medicaid Expansion</i>	Strata	Change associated with Medicaid Expansion (Difference in Differences): 2014				Change associated with Medicaid Expansion (Difference in Differences): 2015			
		<i>Crude</i>		<i>Adjusted</i>		<i>Crude</i>		<i>Adjusted</i>	
		Beta	SE	Beta	SE	Beta	SE	Beta	SE
Household Income (BRFSS Categories)	<\$10,000	6.6***	2.40	7.8**	2.85	6.0*	2.40	5.7	3.66
	\$10,000 to <\$15,000	1.9	2.62	5.2	3.10	6.5*	2.55	10.0**	3.96
	\$15,000 to <\$20,000	3.9	2.20	5.1	2.62	7.0***	2.19	8.2*	3.37
	\$20,000 to <\$25,000	7.8****	2.01	7.0**	2.33	6.5***	2.03	7.1*	3.10
	\$25,000 to <\$35,000	-0.9	1.77	0.5	2.12	1.1	1.76	1.6	2.78
	\$35,000 to <\$50,000	1.0	1.32	2.5	1.61	3.9**	1.34	5.9**	2.13
	\$50,000 to <\$75,000	1.1	1.03	1.5	1.23	0.8	1.09	1.7	1.65
	>\$75,000	-0.8	0.61	-0.8	0.74	-0.2	0.59	0.0	0.96
Household Poverty	\$0-\$25,000	5.2****	1.14	6.3***	1.35	6.4***	1.14	7.8***	1.75
	>\$25,000	0.1	0.52	0.0	0.62	0.5	0.52	1.2	0.81
Educational Attainment	Not college graduate	6.2***	0.51	2.5***	0.78	2.6***	0.50	4.1***	1.02
	College graduate	-0.3	0.39	-0.2	0.64	0.3	0.36	0.1	0.83
Employment Status	Unemployed	6.6***	2.21	7.5**	2.54	9.8***	2.17	12.0***	3.23
	Employed	-0.4	0.61	0.4	0.70	-0.1	0.60	0.5	0.92
Home Ownership	Renter	1.1	0.93	2.3*	1.11	2.1*	0.91	3.5*	1.44
	Homeowner	0.4	0.59	1.1	0.70	1.2*	0.59	2.1*	0.91
	Full Sample	0.8	0.52	1.6**	0.60	1.8***	0.51	2.9***	0.79

Source: BRFSS, 2011-2015

Notes: Table displays crude and adjusted differences-in-differences regression estimates of the change in insurance coverage associated with Medicaid expansion. Models exclude states that expanded Medicaid after 1 January 2014: Michigan (4/1/2014), New Hampshire (8/15/2014), Pennsylvania (1/1/2015), Indiana (2/1/2015), Alaska (9/1/2015), and Montana (1/1/2016). All estimates control for secular trends affecting all states. Adjusted models additionally control for state-specific linear trends and observed covariates unlikely to be affected by the ACA. Standard errors are adjusted for clustering at the state level. BRFSS sampling weights are used. \*p<0.5 \*\*p<0.01 \*\*\*p<0.001

**Appendix Exhibit S10. Percent reduction in health care access gaps by socioeconomic characteristics, 2013 to 2015: expansion vs. non-expansion states.**



*Source: BRFSS 2013, 2015*

Note: Exhibit displays the percent reduction in health care access gaps from 2013 to 2015 by different socioeconomic characteristics. The health access gap by income group is the gap between respondents in households earning < \$25K year and respondents in households earning \$75K or more per year. The gap by educational attainment is the difference between people with some college or less vs. college graduates. Employment status gaps compare the unemployed and employed. Home ownership gaps compare renters with home-owners. The percent reduction was calculated as the difference in 2015 divided by the difference in 2013, minus one. Numeric data are presented in Exhibit S11.

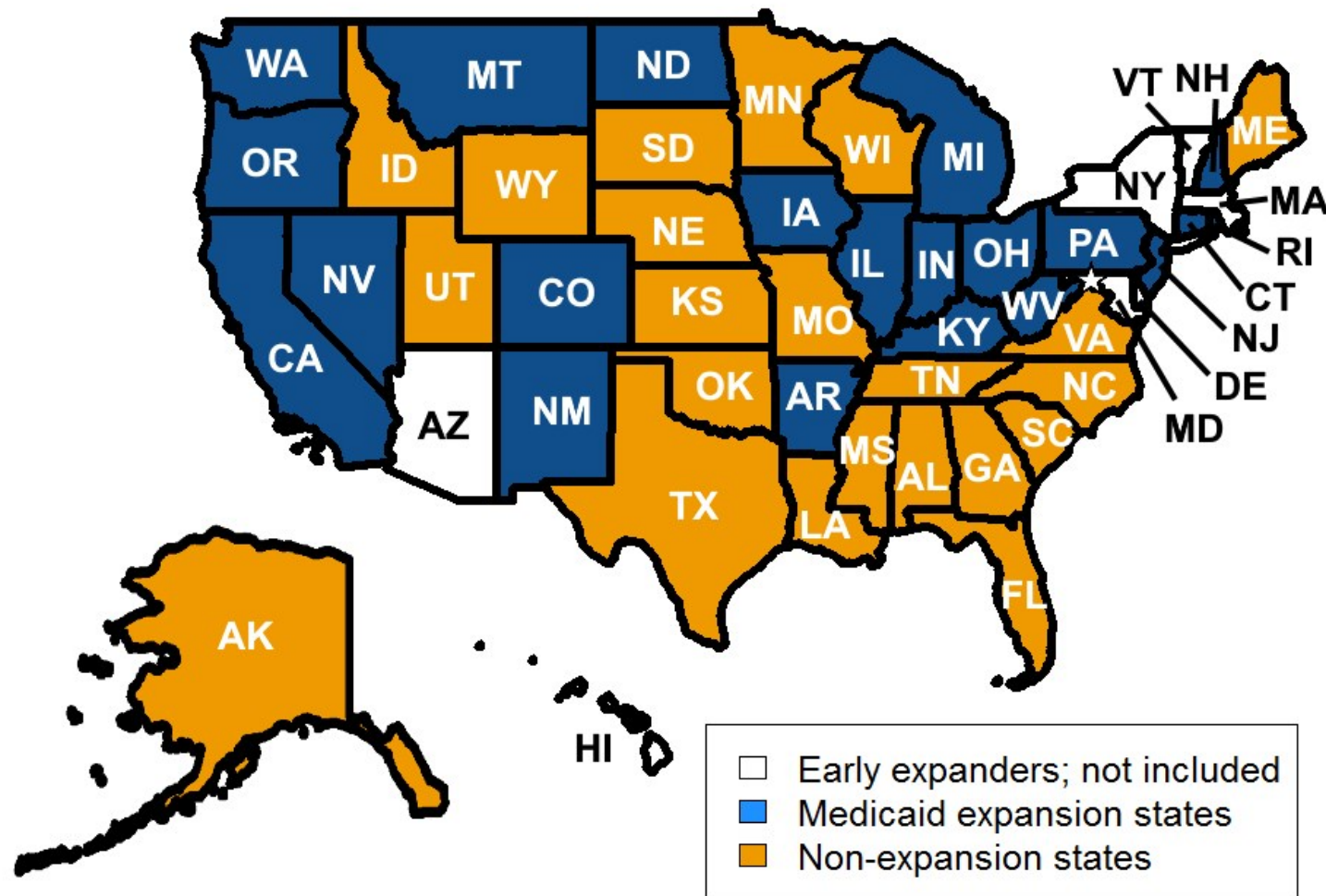
**Appendix Exhibit S11. Socioeconomic disparities in health care access under the ACA**

	<b>Medicaid Expansion States</b>				<b>Non-Expansion States</b>			
<b>Has Insurance Coverage</b>	2013 Gap	2015 Gap	Absolute Change in Gap (95% CI)	Percent Change	2013 Gap	2015 Gap	Absolute Change in Gap (95% CI)	Percent Change
Income	30.9	16.6	-14.3 (-15.8, -12.8)	-46%	36.3	28.1	-8.2 (-10.0, -6.4)	-23%
Education	16.1	10.9	-5.2 (-6.2, -4.3)	-32%	20.8	17.8	-3.1 (-4.3, -1.9)	-14%
Employment	24.9	11.4	-13.4 (-16.1, -10.7)	-54%	30.9	26.6	-4.2 (-7.4, -1.0)	-14%
Home Ownership	17.3	11.1	-6.1 (-7.4, -4.9)	-36%	20.7	15.6	-5.1 (-6.7, -3.5)	-25%
<b>Has a Primary Care Provider</b>	2013 Gap	2015 Gap	Absolute Change in Gap (95% CI)	Percent Change	2013 Gap	2015 Gap	Absolute Change in Gap (95% CI)	Percent Change
Income	23.3	15.4	-7.9 (-9.6, -6.1)	-34%	22.2	18.7	-3.5 (-5.5, -1.5)	-16%
Education	11.2	8.7	-2.6 (-3.8, -1.3)	-22%	12.7	12.5	-0.2 (-1.6, 1.3)	-2%
Employment	13.6	8.6	-4.9 (-7.8, -2.0)	-37%	15.1	12.7	-2.4 (-5.7, 0.8)	-16%
Home Ownership	21.6	18.3	-3.3 (-4.7, -1.9)	-15%	24.1	21.5	-2.6 (-4.2, -0.9)	-11%
<b>Avoids Care Due to Cost</b>	2013 Gap	2015 Gap	Absolute Change in Gap (95% CI)	Percent Change	2013 Gap	2015 Gap	Absolute Change in Gap (95% CI)	Percent Change
Income	25.9	17.3	-8.7 (-10.1, -7.2)	-33%	29.4	24.0	-5.3 (-7.0, -3.6)	-18%
Education	11.2	8.7	-2.5 (-3.4, -1.5)	-22%	13.7	11.7	-2.0 (-3.1, -0.8)	-15%
Employment	18.6	13.1	-5.5 (-8.2, -2.8)	-30%	22.1	17.9	-4.3 (-7.3, -1.2)	-19%
Home Ownership	13.0	8.7	-4.4 (-5.6, -3.2)	-33%	14.5	10.4	-4.1 (-5.6, -2.7)	-28%

*Source: BRFSS 2013, 2015.*

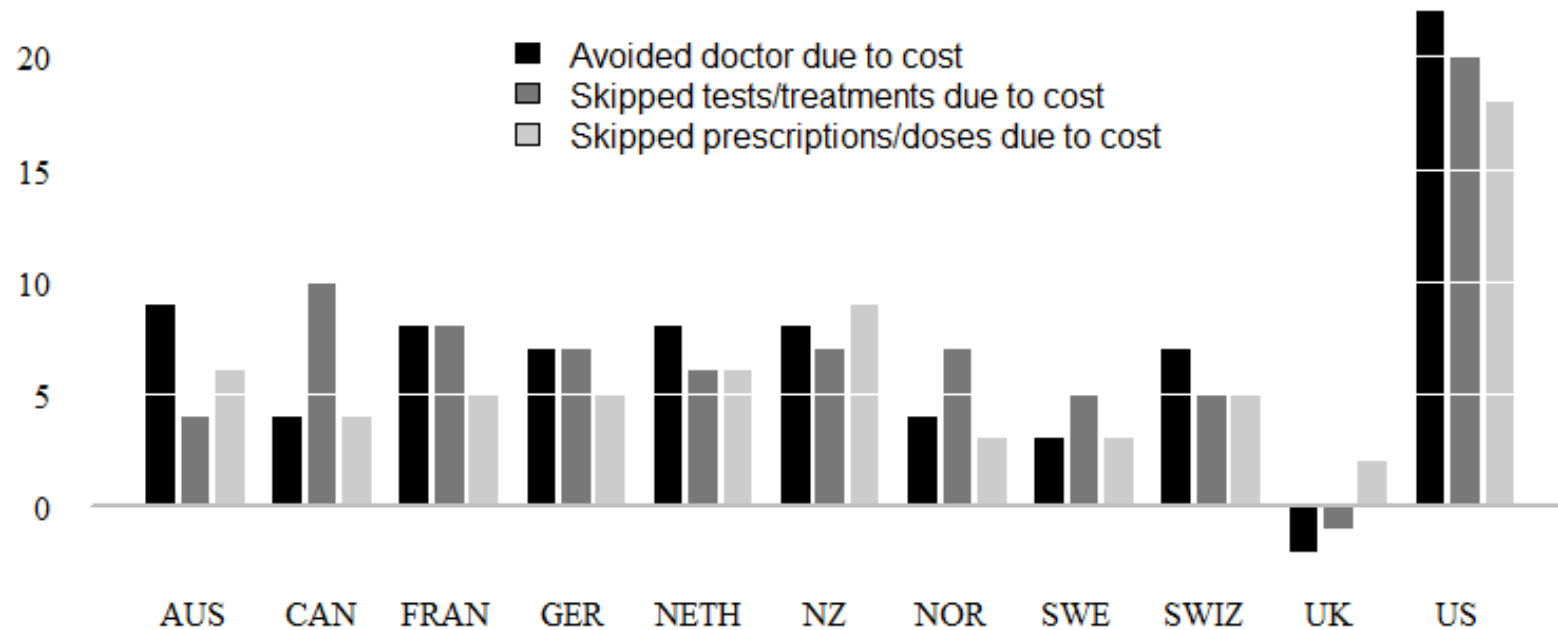
Note: Exhibit presents percentage point differences in health care access between high vs low income groups (\$75,000 plus vs. <\$25,000), college vs non-college educated, employed vs unemployed, and home owners vs renters. Absolute (percentage point) changes in health gaps between 2013 and 2015 and 95% CI's for these changes were estimated as  $\beta_3$  in the regression equation  $E[Y_i] = \beta_0 + \beta_1 Year2015_i + \beta_2 HighSES_i + \beta_3 Year2015_i * HighSES_i$ , where Year2015 is an indicator equal to 1 if year is 2015 and 0 if year is 2013 and HighSES is an indicator equal to 0 if the respondent is in a low SES category and 1 if the respondent is in a high SES category. Relative percent changes from 2013 to 2015 are estimated as Absolute Change / 2013 Gap.

Appendix Exhibit S12. Map of US states included in the analysis as Medicaid expansion and nonexpansion states.



Note: for inclusion criteria and determination of expansion status, see main text of the paper.

**Appendix Exhibit S13. Percentage point gap in access between people above vs. below median income in 11 countries**



Source: Davis, K., Stremikis, K., Squires, D., & Schoen, C. (2014). Mirror, mirror on the wall. How the performance of the US Health care system compares internationally. New York: Commonwealth Fund.



**Appendix Exhibit S14. Missing data on covariates, N=1,278,035**

<b>Variable</b>	<b>% missing of total</b>	<b>Number of missing observations, unweighted</b>
Race	1.8	23,564
Age Group	1.5	19,821
Marital Status	0.7	9,673
Home Ownership	1.8	23,709
Gender	0.0	0
Employment	0.7	9,912
Income Group	12.4	164,880
Educational Attainment	0.5	6,186

Note: 'Missing' includes both refusals and responses of "Don't Know/Not Sure"